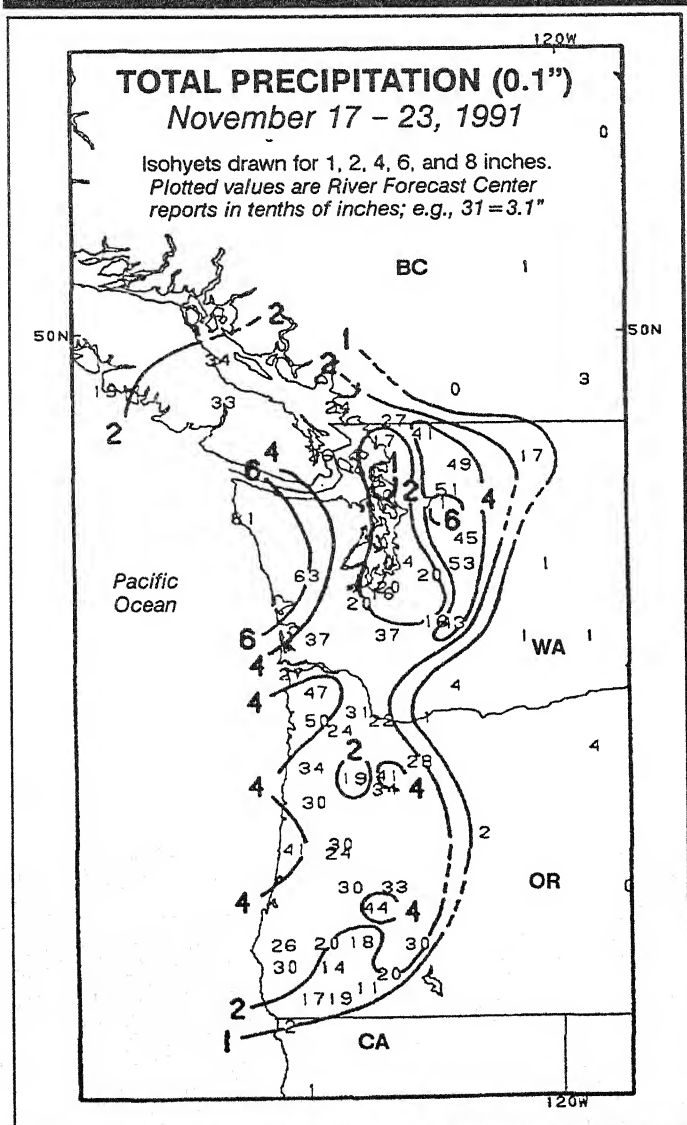


WEEKLY CLIMATE BULLETIN

No. 91/47

Washington, DC

November 23, 1991



Pacific storms battered the Pacific Northwest during the past week with heavy rain and high wind. Up to eight inches of precipitation drenched extreme western Washington while two to six inches were common west of the Cascades in Washington, Oregon, and southwestern British Columbia. A deep low pressure system early in the week spawned a rare outbreak of thunderstorms across the region, with hail and lightning strikes pounding the Puget Sound area. The lightning combined with winds gusting up to 80 mph to topple trees and power lines, cutting off electricity to 400,000 homes and businesses in western Washington, according to press reports



UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE-NATIONAL METEOROLOGICAL CENTER
CLIMATE ANALYSIS CENTER



WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- *Highlights of major climatic events and anomalies.*
- *U.S. climatic conditions for the previous week.*
- *U.S. apparent temperatures (summer) or wind chill (winter).*
- *Global two-week temperature anomalies.*
- *Global four-week precipitation anomalies.*
- *Global monthly temperature and precipitation anomalies.*
- *Global three-month precipitation anomalies (once a month).*
- *Global twelve-month precipitation anomalies (every three months).*
- *Global three-month temperature anomalies for winter and summer seasons.*
- *Special climate summaries, explanations, etc. (as appropriate).*

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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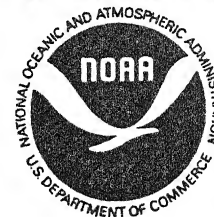
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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF NOVEMBER 23, 1991

North America:

STENTLY ABOVE NORMAL PRECIPITATION MEASURED.

Short-lived, intense precipitation has not been a problem, a large portion of the central United States has been persistently above normal precipitation for over a month. Precipitation across the Great Lakes, northern Plains, has fallen as snow, with a few storms producing deep snows (1-3 feet), especially in the western Great Lakes, Upper Valley, and central Rockies. Last week, 20-40 mm of precipitation was recorded throughout the region, with 175 mm surpluses accumulating in northeastern Texas, lower Mississippi Valley, and the southern and western [5 weeks].

United States:

HEAVY RAINS SOAK THE APPALACHIANS AND NORTHERN MID-ATLANTIC.

Precipitation from east-central Virginia southward along the Atlantic Coast allowed moisture shortfalls to increase, but relief occurred farther north and west as heavy rains soaked the Appalachians and northern mid-Atlantic. Precipitation eliminated significant moisture shortfalls in the Appalachians, but six-week deficits of 50-115 mm elsewhere, with the largest departures reported in Georgia [Florida 8 weeks].

and Northeastern Europe:

ABNORMALLY HIGH PRECIPITATION TOTALS RECORDED.

Last four weeks, precipitation totals of 120-500 mm surpluses of 50-235 mm have fallen across the region. Amounts, and largest departures from normal, have been in portions of the United Kingdom, France, Spain, Yugoslavia, and Italy. More than twice the normal has been measured since mid-October in western

Scotland, the Benelux countries, western France, northern Germany, and most of Austria, Czechoslovakia, and central Italy [4 weeks].

4. Southern India and Sri Lanka:

DRENCHING RAINS ABATE AS WEEK PROGRESSES.

Another wet week plagued southeastern India and Sri Lanka, where 50-150 mm of rain were recorded, but heavy precipitation abated along the southern and western coast of India, where totals of only 10-40 mm were measured. Since early October, 140-280 mm more than normal rainfall has fallen across the region. Most of the week's rain fell early, with drier conditions prevailing from mid-week onward [4 weeks].

5. The Philippines:

TROPICAL SHOWERS CONTINUE TO DOUSE REGION.

Northwestern Luzon, the southern three-fourths of Mindanao, and the western tier of the nation experienced drier weather, with only scattered 10-30 mm totals reported. Elsewhere, however, above normal rains continued, with the heaviest amounts measured early and late in the week. Most locations were soaked by 30-150 mm of rain, keeping short-term moisture surpluses intact [3 weeks].

6. Indonesia:

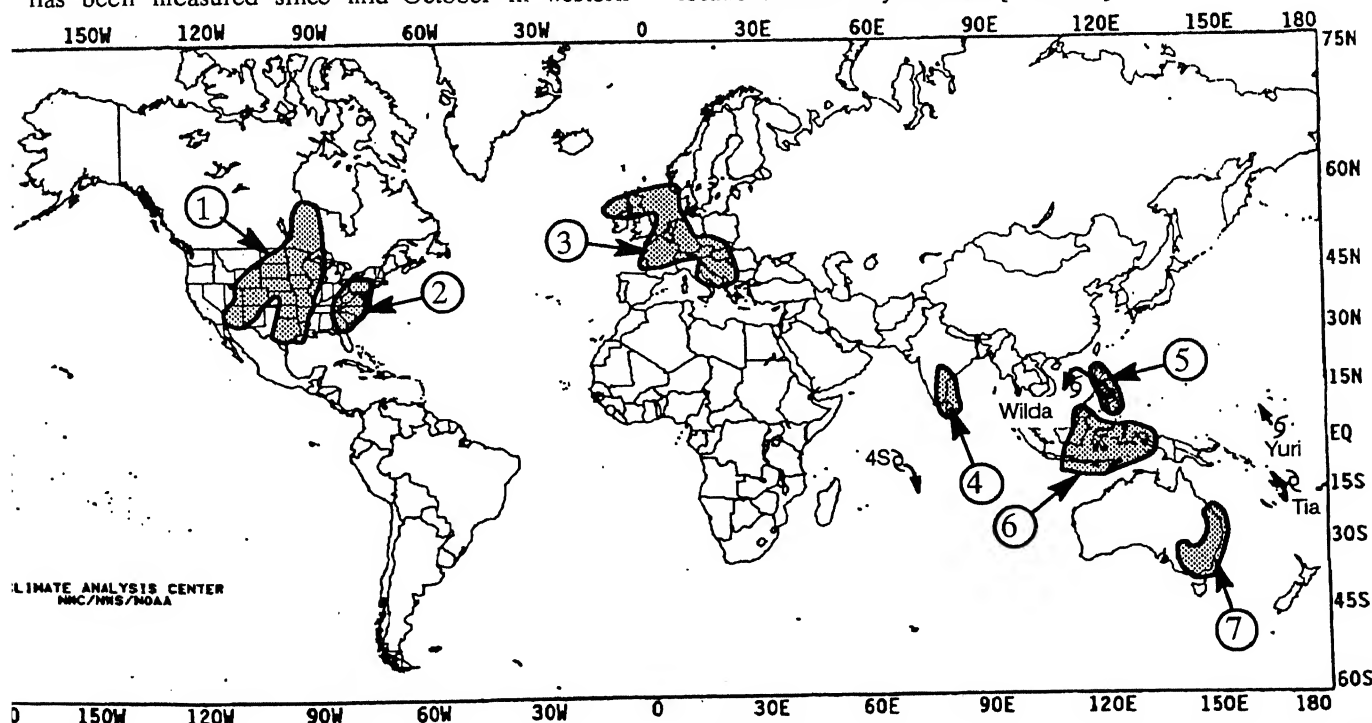
SCATTERED MODERATE RAINS PROVIDE LIMITED RELIEF

Although reliable data were lacking last week, scattered daily rainfall totals of 15-35 mm early in the week from central Java and Borneo westward appeared to taper off as the week progressed. Since early October, 60-120 mm less than normal rainfall has been measured across portions of Java, eastern Borneo, Celebes, the eastern Sundas, and the Moluccas [12 weeks].

7. Eastern Australia:

MORE DRY WEATHER FOLLOWS A BRIEF RESPITE.

The previous week's wet spell proved to be short-lived as dry conditions again prevailed in most areas. Moderate to heavy rains (20-80 mm) soaked portions of southwestern Queensland, but little or no rain (under 25 mm) was measured across the eastern half of Queensland and throughout New South Wales and Victoria. Six-week departures of 50-120 mm have accumulated at many locations since early October [17 weeks].



EXPLANATION

1. Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.
2. Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF NOVEMBER 17 – 23, 1991

A slow moving cold front trekked from the Mississippi Valley to the Atlantic Coast states during the week, accompanied by moderate to heavy rain. A broad area from eastern Texas and the central Gulf coast to southern New England was soaked with 2 – 5 inches (page 6). The rain was much needed over the parched central and southern Appalachians and portions of the mid-Atlantic, but aggravated long-term moisture surpluses in the lower Mississippi Valley and Gulf Coast. Southerly winds ahead of the system brought record late-season warmth to the eastern seaboard as weekly temperatures averaged 6°F to 16°F above normal over much of the nation east of the Mississippi. On Wednesday, highs of 75°F at Beckley, WV, 76°F at Concord, NH, and 70°F at Portland, ME, were the highest temperatures ever recorded for so late in the year. Early in the week, a powerful Pacific storm packing 80 mph winds left more than 400,000 homes and businesses in western Washington without power. This storm and a subsequent system brought heavy rain (snow in the higher elevations) to western Washington and Oregon (see front cover). These storms also brought heavy snow to the Rockies as they progressed eastward. Later in the week, a winter storm blasted the north-central states with heavy snow as over a foot buried parts of Wisconsin. Further north, record cold gripped much of Alaska. Temperatures across all but the southern portions of the state averaged 8°F to 19°F below normal. Abnormally warm and dry weather continued across Hawaii.

As the week commenced, a powerful Pacific storm pounded the Northwest, producing a rare thunderstorm outbreak with severe lightning and high wind. The storm system spread into the Rockies and central High Plains, dumping over a foot of snow on some locations. Elsewhere, a cold front edged eastward across the Mississippi Valley into the Great Lakes, Appalachians, and Southeast. Slow moving thunderstorms along and ahead of the front drenched the nation's midsection. Severe thunderstorms spawned tornadoes in eastern Texas and southern Illinois, causing some damage to homes. Unseasonable warmth prevailed ahead of the front as a number of stations set daily high record temperatures.

Around mid-week, a second Pacific storm system moved from the Northwest into the northern and central Rockies, bringing more heavy snow. Meanwhile, the frontal system in the nation's midsection continued to drift eastward, generating heavy rain from the central Gulf coast to the lower Great Lakes and southern New

England. Temperatures remained unseasonably high along the Atlantic seaboard ahead of the frontal system. At week's end, A strong winter storm moved across the northern and central Great Plains and into the upper Great Lakes and middle Mississippi Valley, blanketing portions of Wisconsin under a foot of snow. Freezing rain glazed roads in Nebraska, causing more than 100 accidents. Cold air and high winds in the storms wake pushed wind chills into the single digits.

According to the River Forecast Centers, the largest precipitation totals (more than 2 inches) were measured in a broad area from eastern Texas and the central Gulf coast to southern New England, across western Washington and Oregon, and in portions of the middle Mississippi Valley and central Rockies [Table 1]. More than seven inches drenched portions of western Washington, eastern Tennessee, central Alabama, and southwestern North Carolina. Scattered amounts greater than 2 inches fell across the northern and central Intermountain West, Great Lakes, and southern Alaska. Light to moderate totals were measured across the remainders of the eastern half of the nation, northern and central Rockies, northern and central Intermountain West, Pacific Northwest, and southern Alaska. Little or no precipitation occurred in southern California, the desert Southwest, the southern Rockies, the northern and southern High Plains, northern and central Alaska, and most of Hawaii.

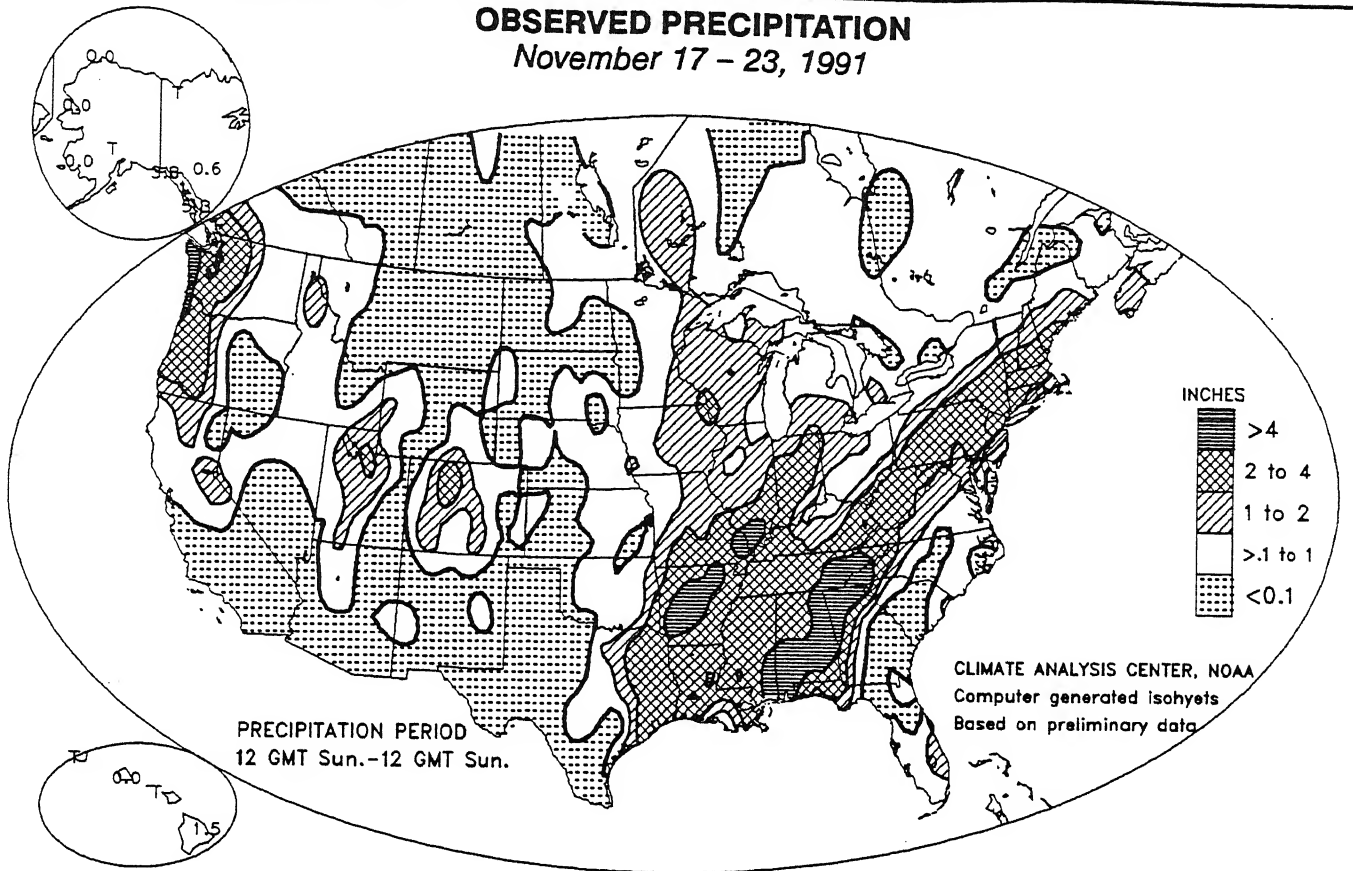
Unusually warm weather spread across the northern Rockies, northern and central Plains, and eastern half of the nation [Table 2]. Weekly departures of +8°F to +16°F were common across the Southeast, Ohio Valley, Appalachians, mid-Atlantic, and Northeast as temperatures rose into the seventies as far north as southern New England. Departures of +3°F to +7°F were prevalent across the Mississippi Valley, northern and central Plains, and northern Rockies. In Alaska, mild weather was confined to southern portions of the state while Hawaii remained unusually mild.

Subnormal temperatures prevailed across the Intermountain West, central and southern Rockies, southern Plains, and much of Alaska [Table 3]. The largest departures were found in the central Rockies, where temperatures averaged 8°F below normal, and northern Alaska, where the mercury dropped to -34°F at Barrow. A strong winter storm ushered bitterly cold arctic air into the northern Plains and upper Mississippi Valley at week's end, sending wind chills plunging.

TABLE 1. SELECTED STATIONS WITH 3.00 OR MORE INCHES OF PRECIPITATION DURING THE WEEK OF NOVEMBER 17 – 23, 1991

<u>STATION</u>	<u>TOTAL</u> <u>(INCHES)</u>	<u>STATION</u>	<u>TOTAL</u> <u>(INCHES)</u>
QUILLAYUTE, WA	8.08	STAMPEDE PASS, WA	3.67
CAPE GIRARDEAU, MO	5.63	MEMPHIS, TN	3.65
MOBILE, AL	5.49	MONTGOMERY/MAXWELL AFB, AL	3.60
ANNETTE ISLAND, AK	5.31	TUSCALOOSA, AL	3.52
MONTGOMERY, AL	4.90	HOUSTON, TX	3.44
MERIDIAN, MS	4.29	PARKERSBURG/WOOD CO, WV	3.44
LITTLE ROCK AFB, AR	4.26	CHATTANOOGA, TN	3.41
COLUMBUS, GA	4.08	CENTERVILLE, AL	3.36
YAKUTAT, AK	3.79	CHARLESTON, WV	3.24
JACKSON, KY	3.73	SHREVEPORT, LA	3.22
KNOXVILLE, TN	3.72	HARRISON, AR	3.19
OZARK/CAIRNS AFB, AL	3.71	MERIDIAN NAS, MS	3.12
COLUMBUS/FT BENNING, GA	3.69	PENSACOLA, FL	3.04
MEMPHIS NAS, TN	3.67	BOSSIER CITY/BARKSDALE, LA	3.01

OBSERVED PRECIPITATION November 17 - 23, 1991



DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F) November 17 - 23, 1991

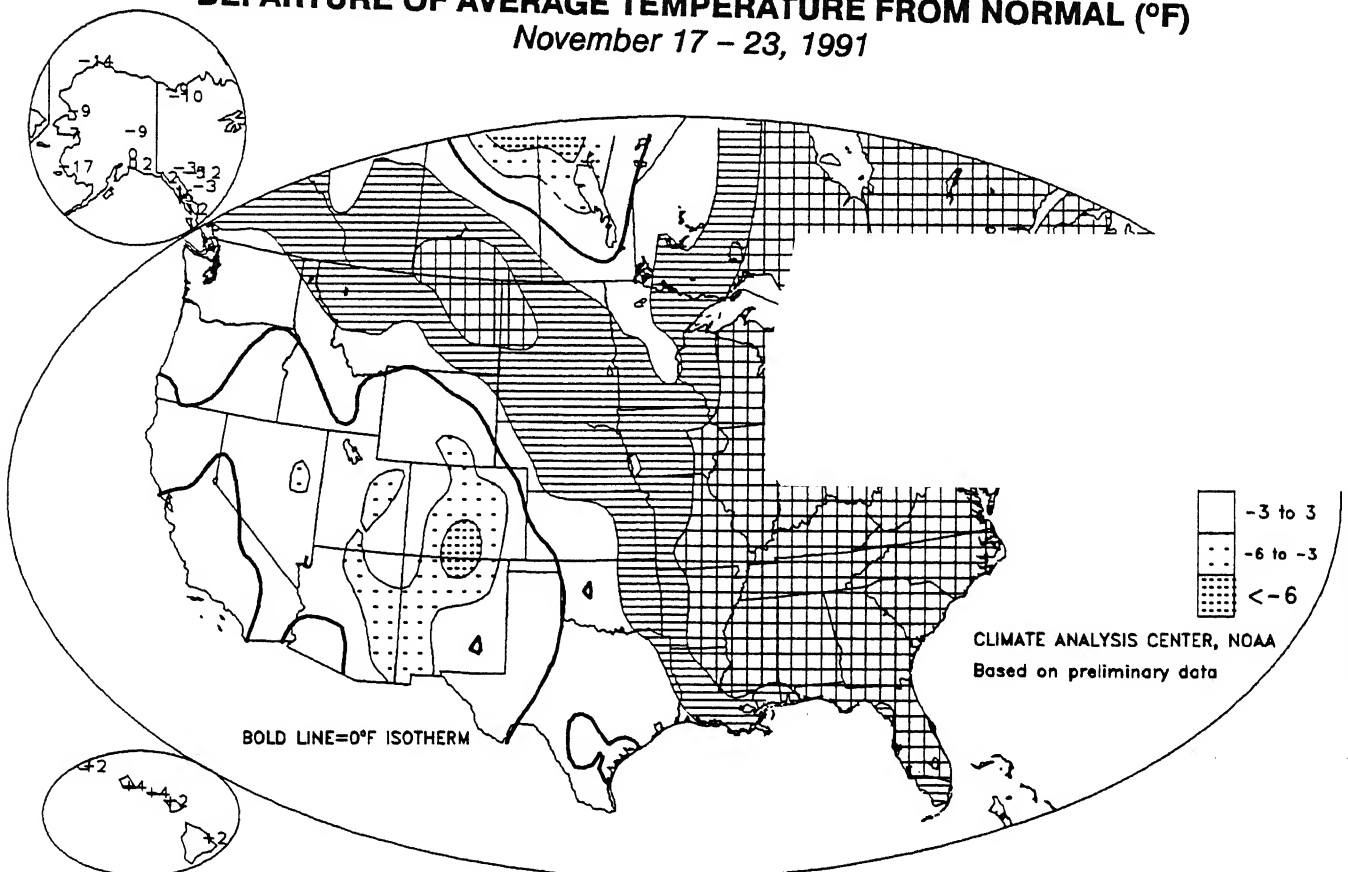


TABLE 2. SELECTED STATIONS WITH TEMPERATURES AVERAGING 11.5°F OR MORE ABOVE NORMAL FOR THE WEEK OF NOVEMBER 17 – 23, 1991

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
BECKLEY, WV	+15.9	56.4	ALTOONA, PA	+12.2	50.5
BRISTOL, TN	+15.2	59.8	BRADFORD, PA	+12.2	46.2
CHARLESTON, WV	+14.9	58.9	NASHVILLE, TN	+12.1	59.1
BLUEFIELD, WV	+14.9	56.7	MORGANTOWN, WV	+12.1	54.1
BOWLING GREEN, KY	+13.8	58.4	ALBANY, GA	+12.0	67.1
HUNTINGTON, WV	+12.9	57.4	LOUISVILLE/STANDIFORD, KY	+12.0	56.4
KNOXVILLE, TN	+12.7	59.7	PITTSBURGH, PA	+11.8	51.9
LEXINGTON, KY	+12.5	55.8	PADUCAH, KY	+11.7	56.6
MT WASHINGTON, NH	+12.4	31.2	CROSSVILLE, TN	+11.6	55.1
JACKSON, KY	+12.3	57.4	PARKERSBURG/WOOD CO, WV	+11.6	54.7
BELLEVILLE/SCOTT AFB, IL	+12.3	54.2	COLUMBUS, OH	+11.6	52.1
ZANESVILLE, OH	+12.2	52.3	MACON/WARNER-ROBINS AFB, GA	+11.5	64.9
ELKINS, WV	+12.2	50.8	CHARLOTTE, NC	+11.5	60.9

TABLE 3. SELECTED STATIONS WITH TEMPERATURES AVERAGING 4.0°F OR MORE BELOW NORMAL FOR THE WEEK OF NOVEMBER 17 – 23, 1991

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
ANIAK, AK	-19.6	-7.3	TRINIDAD, CO	-5.9	32.7
BETHEL, AK	-17.6	-1.8	GULKANA, AK	-5.5	-0.7
BETTLES, AK	-17.5	-19.0	PUEBLO, CO	-5.3	32.9
KING SALMON, AK	-16.3	5.3	PRICE, UT	-5.1	29.7
BARROW, AK	-14.9	-17.9	COLORADO SPRINGS, CO	-5.0	30.6
BIG DELTA, AK	-12.4	-6.8	ST PAUL ISLAND, AK	-4.8	28.0
MCGRATH, AK	-11.5	-8.5	COLD BAY, AK	-4.8	28.9
FAIRBANKS, AK	-9.7	-8.6	LARAMIE, WY	-4.1	23.3
KOTZEBUE, AK	-9.0	-2.8	HOMER, AK	-4.0	23.9
ALAMOSA, CO	-8.0	19.5	DENVER, CO	-4.0	32.9
NOME, AK	-7.9	6.5			

EXTREME MAXIMUM TEMPERATURE (°F)
November 17 – 23, 1991

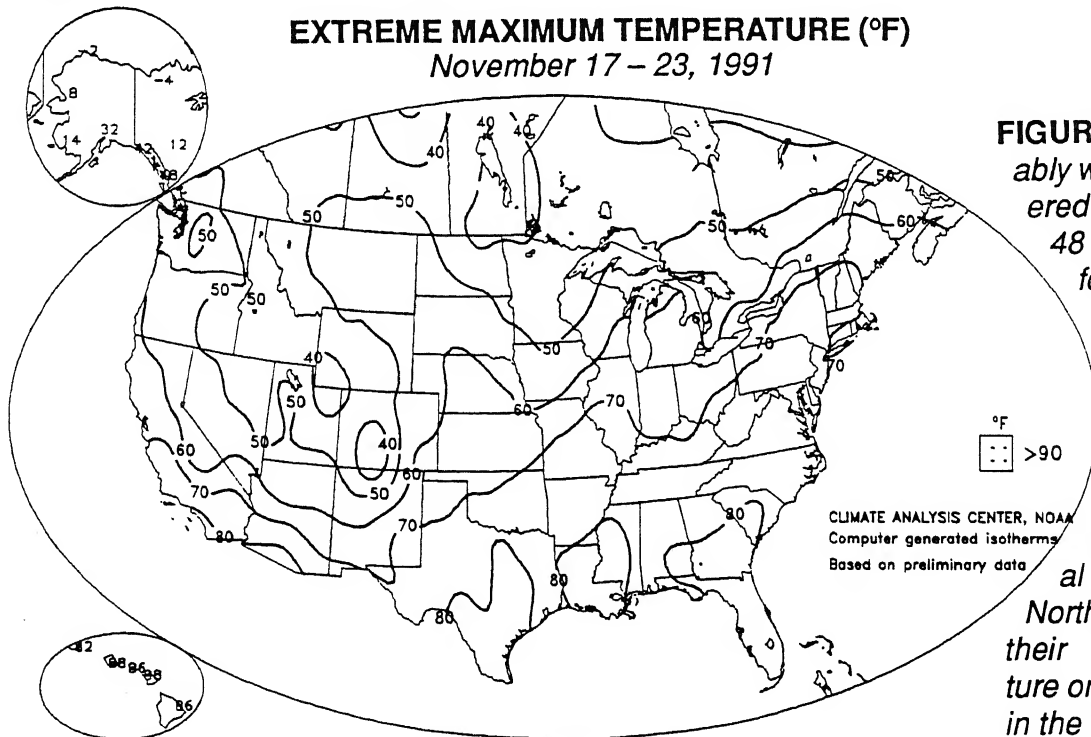
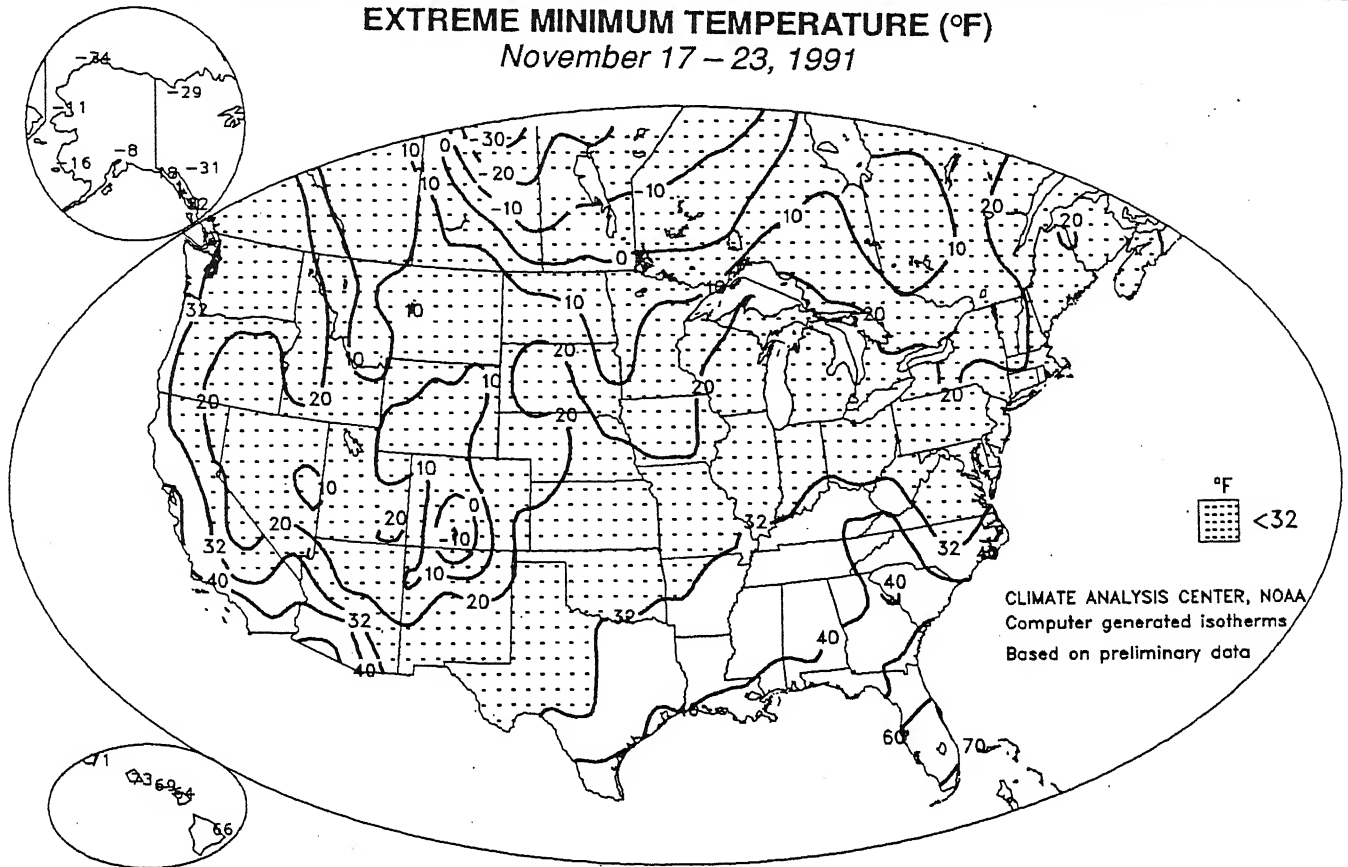


FIGURE 1. Unseasonably warm weather covered much of the lower 48 states and Hawaii for most of last week. Temperatures soared into the seventies as far north as southern Maine, and several stations in the Northeast reported their highest temperature on record for so late in the year.

EXTREME MINIMUM TEMPERATURE (°F)

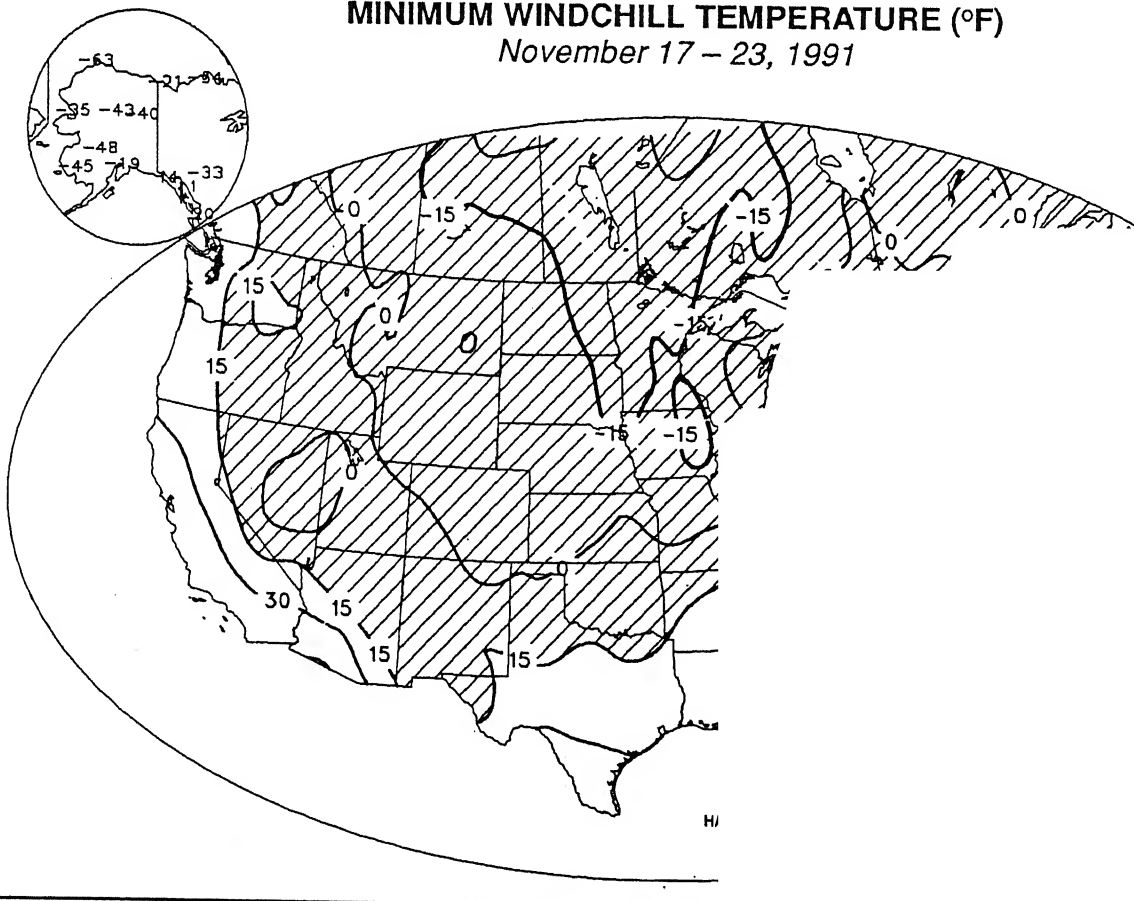
November 17 – 23, 1991



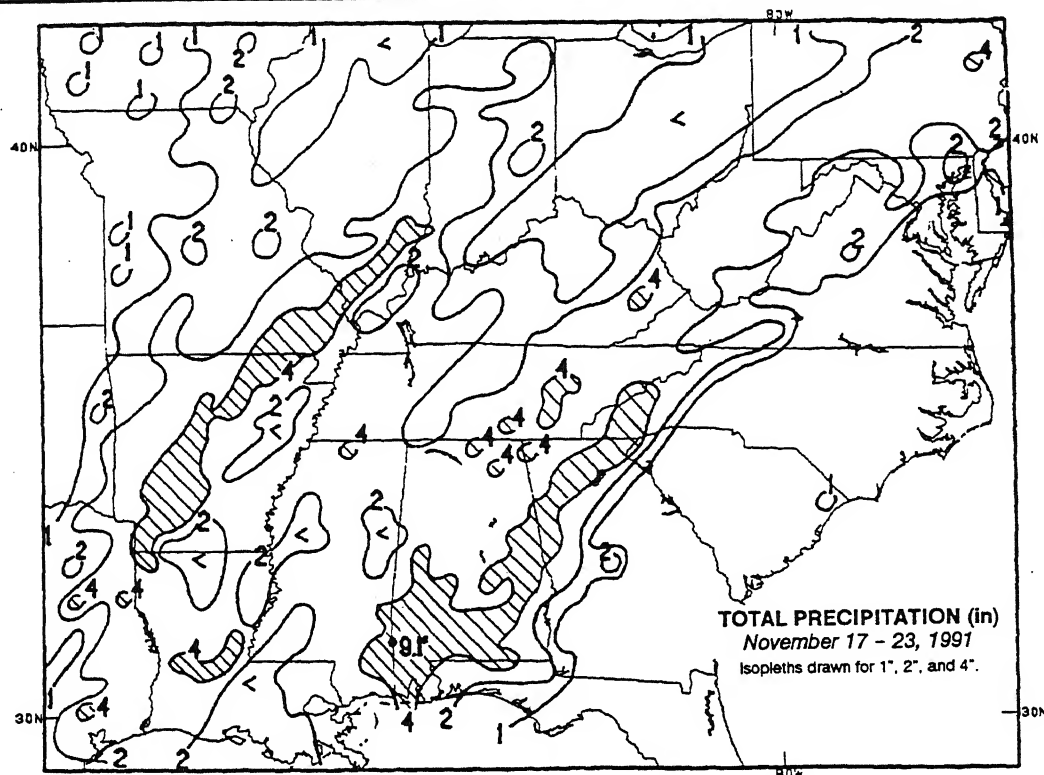
Unseasonably mild weather kept temperatures above normal for most of the week, but brief spells of cool weather brought subfreezing temperatures to all but the southeastern quarter of the nation and immediate West Coast (top). At week's end, colder air and gusty winds invaded the north-central states, producing subzero wind chills in the central Rockies, northern Plains, and upper Midwest (bottom).

MINIMUM WINDCHILL TEMPERATURE (°F)

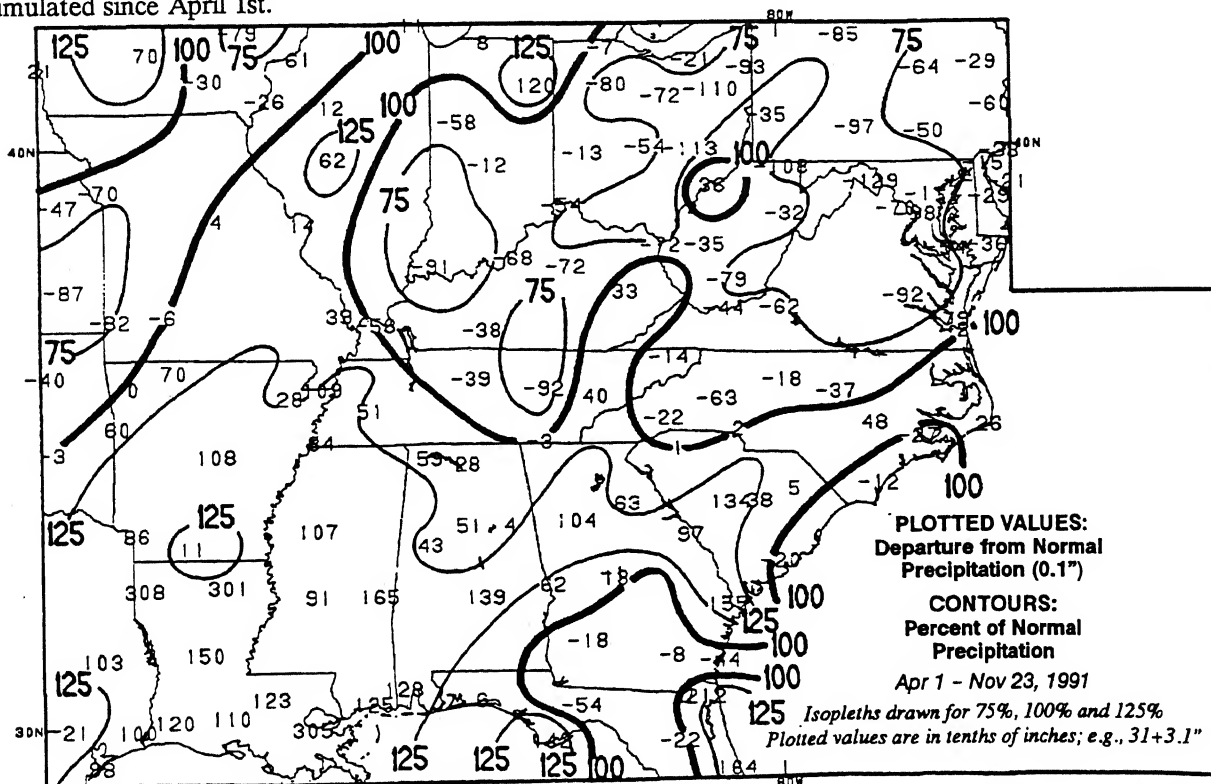
November 17 – 23, 1991



CLIMATE HIGHLIGHTS FEATURE

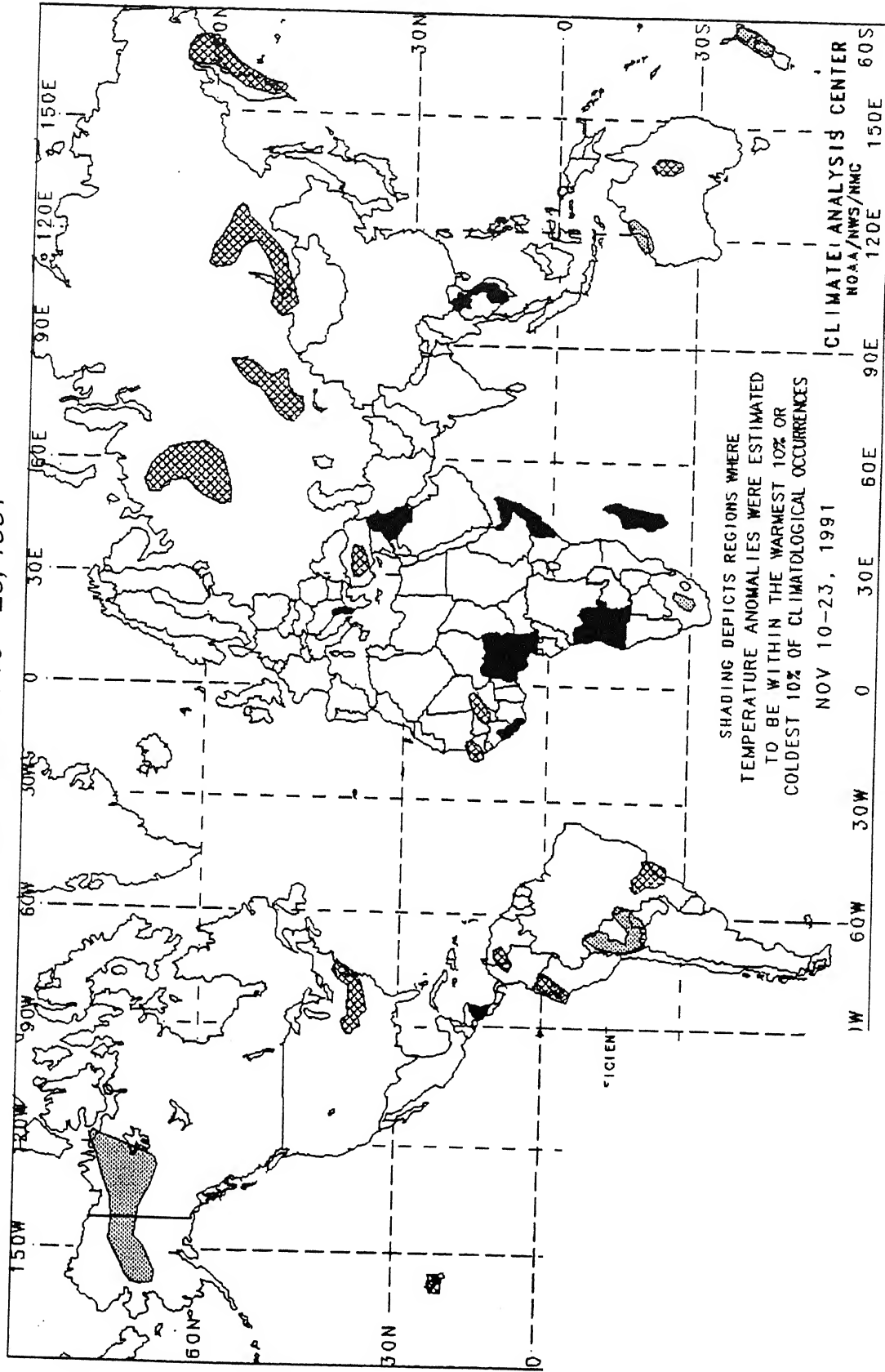


A frontal system drifted through the Mississippi Valley and into the Southeast and mid-Atlantic during the week, generating slow-moving showers and thunderstorms along and ahead of the system. Several areas in the lower Mississippi Valley, central Gulf Coast, and southern Appalachians measured 4 to 9.1 inches of rain (top). The rains were very beneficial in easing long-term dry conditions in the Tennessee Valley, Appalachians, and northern mid-Atlantic, where many locations have still received less than 75% of normal precipitation since April 1 (bottom). In contrast, weekly precipitation totals of under an inch fell on most of Ohio, where shortfalls exceeding 11 inches have accumulated during the past 8 months. Heavy rain, however, aggravated the prolonged wet spell across the central Gulf coast and lower Mississippi Valley, where moisture surpluses of over 30 inches have accumulated since April 1st.



2-WEEK GLOBAL TEMPERATURE ANOMALIES

NOVEMBER 10 - 23, 1991



Approximately 2500 observing stations were received from synoptic hour basis so many night time sing observations the estimated in turn may have resulted in an

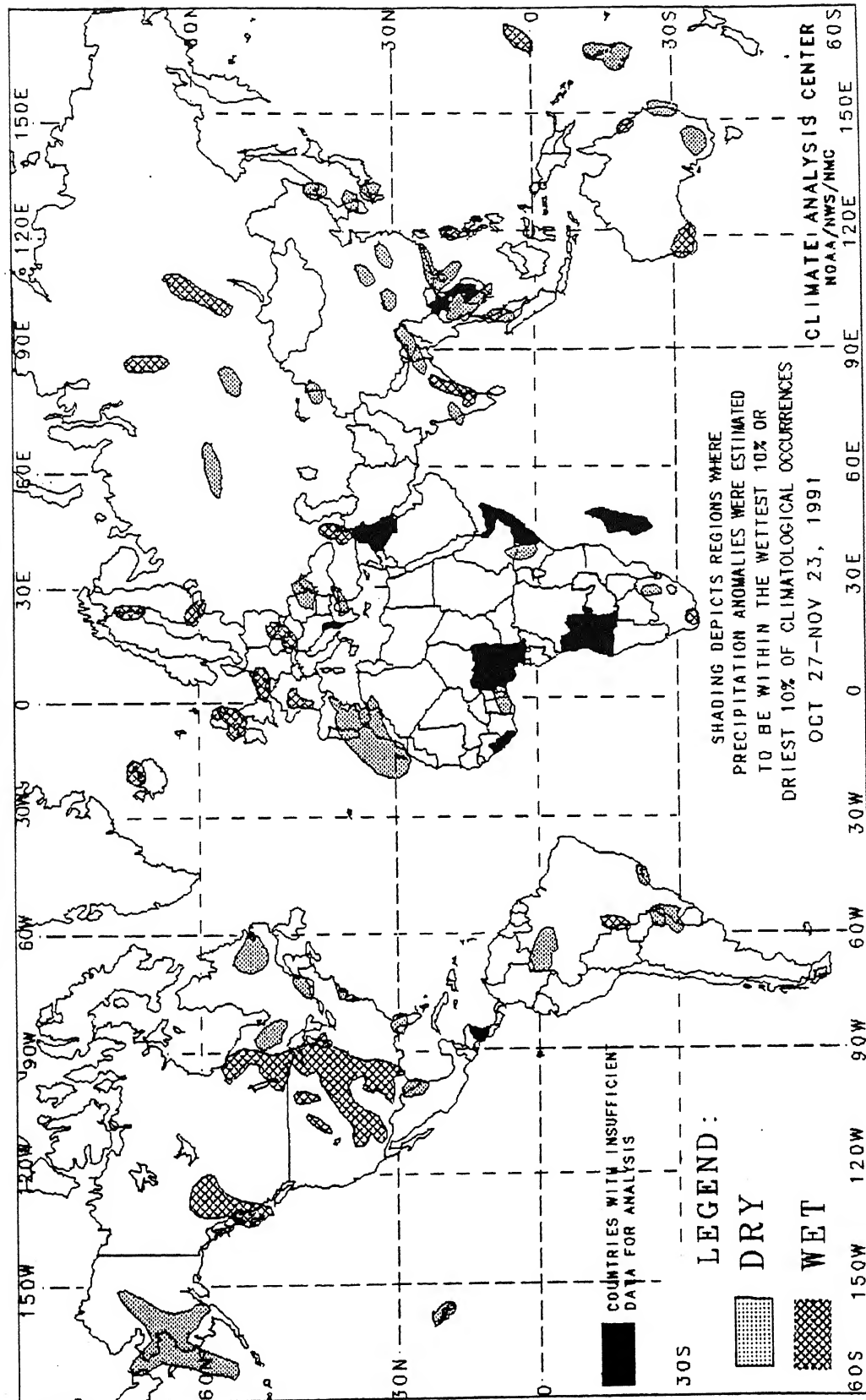
the magnitude of temperature

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

4-WEEK GLOBAL PRECIPITATION ANOMALIES

OCTOBER 27–NOVEMBER 23, 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

